

Feather mites (Acariformes, Astigmata) detected on some birds in Türkiye: new records and new host-parasite associations

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Abstract

Feather mite specimens (Astigmata: Analgoidea and Pterolichoidea) used in this study were collected from 29 dead bird individuals of various orders in Artvin, Erzurum, Rize, and Sakarya (Türkiye) during 2023–2024. As a result of ectoparasitic examination, 22 feather mite species were detected. Of the mite species detected, fourteen species (*Glaucalges attenuatus*, *Kramerella bubonis*, *Montesauria merulae*, *M. cylindrica*, *Pandalura cirrata*, *Picalgoides diaphanoxus*, *Proctophyllodes ateri*, *P. glandarinus*, *P. hipposideros*, *P. locustellae*, *P. microstylifer*, *P. picae*, *P. pinnatus*, and *Scutulanayssus ottuki*) are new records for the ectoparasitic fauna in Türkiye. Additionally, new host-parasite associations were revealed for *Gabucinia delibata*, *Hieracolichus ramosus*, and *Montesauria merulae* feather mite species.

Keywords

Analgoidea, Aves, Ectoparasite, fauna, Pterolichoidea, Türkiye.

Introduction

Studies of host-parasite relationships, especially those of mites and wild birds, have recently increased in Türkiye (Gürler et al. 2013, Per and Aktaş 2018). In parallel with this, it is seen that the ectoparasitic fauna associated with wild birds in Türkiye increases with each study conducted. In these studies, new species records and new

host-ectoparasite associations for the feather mite fauna of Türkiye are detected (Eren et al. 2023). According to the latest published checklist, the bird fauna in Türkiye consists of 500 species (Karataş et al. 2021). Therefore, the feather mite fauna in Türkiye is expected to show diversity and richness depending on the diversity of rich birds. Feather mites are generally thought to have evolved together with their hosts and are mostly host-specific organisms. Since it is accepted that each individual avian host has an average of 2–3 specific feather mites (Dabert and Mironov 1999), the expected feather mite fauna of Türkiye could be over 500. However, current studies on ectoparasites of wild birds in Türkiye are not extensive. Up to now, investigations of feather mite fauna conducted in Türkiye have reported about 60 species (Philips and Fain 1991, Özkan et al. 2017, Eren and Açıci 2022, Eren et al. 2022, 2023).

This present work reports new records for the feather mite fauna of birds in Türkiye and reveal host-ectoparasite associations.

Materials and Methods

During the field studies in different locations in Türkiye (Artvin, Erzurum, Rize, and Sakarya) in 2023 and 2024, bird specimens found dead in nature and on highways were subjected to ectoparasitic examination (Table 1). The detected feather mite specimens were preserved in Eppendorf tubes containing 70% ethanol. Feather mite specimens were made transparent with lactophenol for a while, then mounted on microscopic slides in Hoyer's medium. All mounted slides were dried at room temperature for 1–2 weeks and sealed with colourless nail polish. Finally, ectoparasite specimens were identified under the light microscopes (MIC-B30/B Binocular Economic Microscope-Led-Achromat, Soif Optical Instruments Factory, China) and using relevant literature sources (Bonnet 1924, Dubinin 1953, Atyeo and Braasch 1966, Atyeo and Gaud 1970, Mack-Fira and Cristea 1966, Gaud 1957, 1980, 1983, Černý 1979, Gaud and Atyeo 1985, Chirov and Mironov 1987, Mironov 2006, 2011, 2012).

Results and Discussion

Superfamily Analgoidea Trouessart & Mégnin, 1884

Family Analgidae Trouessart & Mégnin, 1884

Subfamily Analginae Trouessart & Mégnin, 1884

Genus *Analges* Nitzsch, 1818

The genus *Analges* is the oldest feather mite genus and currently includes about 64 species, predominantly associated with birds in the order Passeriformes (Gaud 1974, Mironov 1985, Dabert et al. 2018, Pedroso and Hernandes 2018). Reliable species identification in *Analges* species is generally based on males, with exceptions for

some species easily recognisable, because females generally have a very uniform morphological appearance (Mironov 2019a; Dabert et al. 2022).

Up to now, the genus *Analges* was represented by 4 species in the fauna of Türkiye: *Analges mucronatus* Buchholz, 1969, *A. passerinus* (Linnaeus, 1758), *A. spiniger* Giebel, 1871, and *A. turdinus* Mironov, 1985 (Gürler et al. 2013, Per and Aktaş 2018, Eren and Açıçı 2022, Eren et al. 2022).

Analges sp.

Materials examined. 2 females from flight and tail feathers ex the European Goldfinch *Carduelis carduelis* (Linnaeus, 1758) (Passeriformes: Fringillidae), Merkez District (Çoruh University, Merkez Campus), Artvin Province, Türkiye, 26 March 2023, coll. G. Eren. 2 females from flight feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Aves: Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

Subfamily Anomalginae Gaud & Atyeo, 1982

Genus *Strelkoviacarus* Dubinin, 1953

To date, the genus *Strelkoviacarus* includes five described species found to infest members of many avian orders (Coraciiformes, Piciformes, Galliformes, Strigiformes, and Passeriformes) (Trouessart and Neumann 1888, Dubinin 1953, Spory 1965, Hill et al. 1967, Gaud and Atyeo 1996, Mironov et al. 2010, Pedroso and Hernandes 2018).

In previous studies conducted in Türkiye, only *S. quadratus* has been reported from the Eurasian blackcap *Sylvia atricapilla* (Linnaeus, 1758) in Samsun (Gürler et al. 2013, Per and Aktaş 2018). The Coal Tit *Periparus ater* (Linnaeus, 1758) is a new host record for *S. quadratus*.

Strelkoviacarus quadratus (Haller, 1882)

Materials examined. 4 males and 4 females from flight and tail feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

Family Proctophyllodidae Mégnin and Trouessart, 1884

Subfamily Proctophyllodinae Mégnin and Trouessart, 1884

Genus *Monojoubertia* Radford, 1950

The genus *Monojoubertia* consists of twelve described species from passerines of the families Dicaeidae, Fringillidae, and Petroicidae (Atyeo 1967, 1971, Atyeo and Gaud 1970). In previous studies conducted in Türkiye, *M. microphylla* has been reported on *Fringilla coelebs* in Samsun (Gürler et al. 2013, Eren et al. 2022).

***Monojoubertia microphylla* (Robin, 1877)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian chaffinch *Fringilla coelebs* Linnaeus, 1758 (Passeriformes: Fringillidae), Borçka District (Zorlu Village), Artvin Province, Türkiye, 9 November 2023, coll. G. Eren.

Genus *Proctophyllodes* Robin, 1877

Proctophyllodes Robin, 1877 is the most specious genus among all feather mites (Astigmata: Analgoidea and Pterolichoidea). Up to now, approximately 200 described species are associated with bird species from many orders, especially the Passeriformes (Atyeo and Braasch 1966, Mironov 2012, 2019b, Sun et al. 2023). When we look at the feather mite species identified so far in Türkiye, *Proctophyllodes* species come first: *P. cetti* Badek, Mironov et Dabert, 2008, *P. clavatus* Fritsch, 1961, *P. doleophyes* Gaud, 1957, *P. lusciniae* Burdejnaja et Kivganov, 2009, *P. mesocaulus* Mack-Fira et Cristea-Nastasescu, 1968, *P. musicus* Vitzthum, 1922, *P. rubeculinus* (Koch, 1841), *P. scolopacinus* (Koch, 1842), *P. stylifer* (Buchholz, 1869), *P. sylviae* Gaud, 1957, and *P. troncatus* Robin, 1877 (Gürler et al. 2013, Per and Aktaş 2018, Eren and Açıci 2022, Eren et al. 2023).

Among seven *Proctophyllodes* species detected in the present study, *P. ateri* Fritsch, 1961 (Fig. 1), *P. hipposideros* Gaud, 1958 (Fig. 2), *P. glandarinus* (Koch, 1841) (Fig. 3), *P. locustellae* Chirov et Mironov, 1987 (Fig. 4), *Proctophyllodes microstylifer* Mironov, 2012 (Fig. 5), *P. picae* (Koch, 1840) (Fig. 6), and *P. pinnatus* (Nitzsch, 1818) (Fig. 7), are new record for the feather mite fauna in Türkiye.

***Proctophyllodes ateri* Fritsch, 1961**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

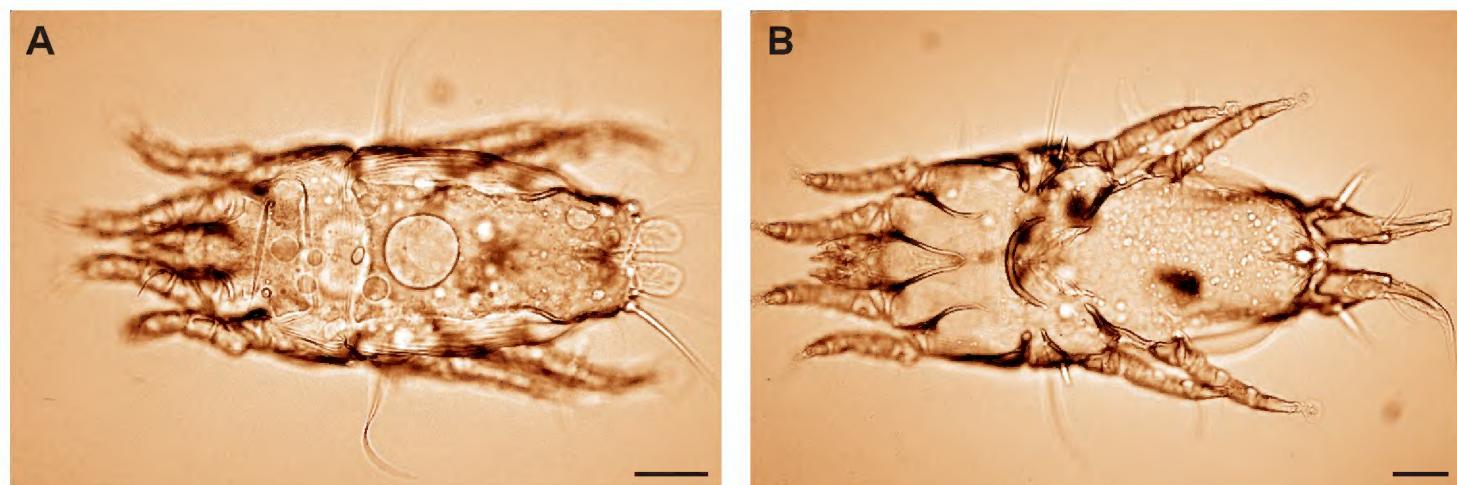


Figure 1. *Proctophyllodes ateri* — A Male, B Female (scale bars: 50 µm).

***Proctophyllodes hipposideros* Gaud, 1958**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Common Quail *Coturnix coturnix* (Linnaeus, 1758) (Galliformes: Phasianidae), Borçka District (Kaleköy Village), Artvin Province, Türkiye, 18 March 2023, coll. G. Eren.

Remark. *Proctophyllodes hipposideros* is commonly associated with various muscicapids of the genera *Oenanthe*, *Saxicola*, and *Phoenicurus* (Atyeo and Braasch 1966). The record of this species on the Common Quail is probably the result of accidental transfer from some muscipapid hosts living on the same biotope.

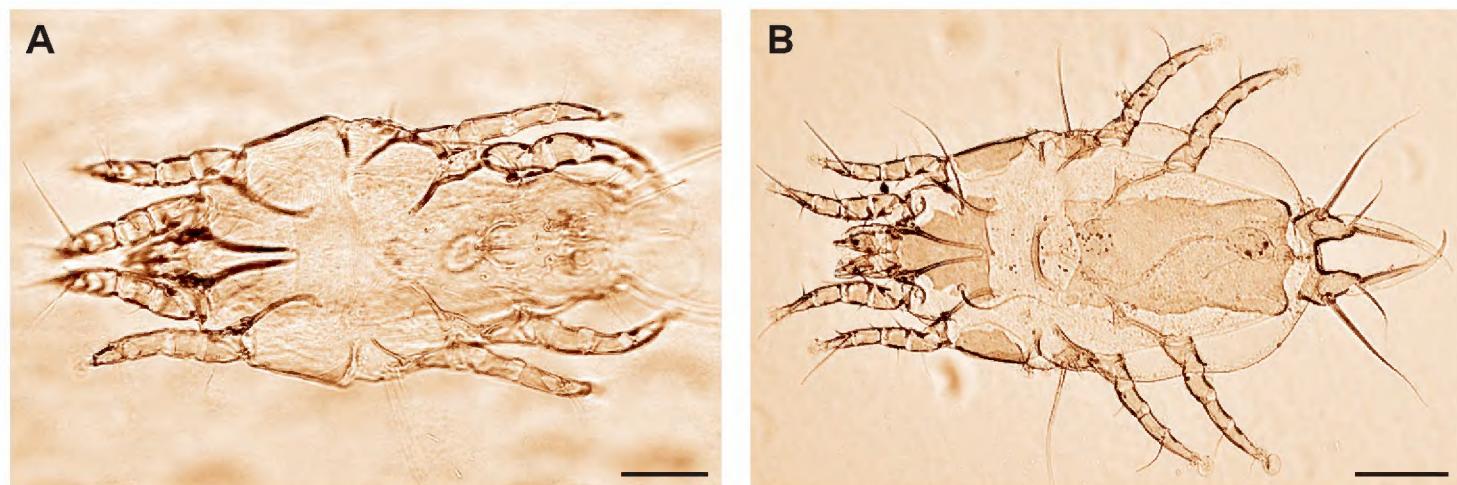


Figure 2. *Proctophyllodes hipposideros* — A Male, B Female (scale bars: 100 µm).

***Proctophyllodes glandarinus* (Koch, 1841)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian jay *Garrulus glandarius* (Linnaeus, 1758) (Passeriformes: Corvidae), Karasu District (Kuzuluk Neighbourhood-Tuzla Location), Sakarya Province, Türkiye, 1 February 2023, coll. G. Eren.

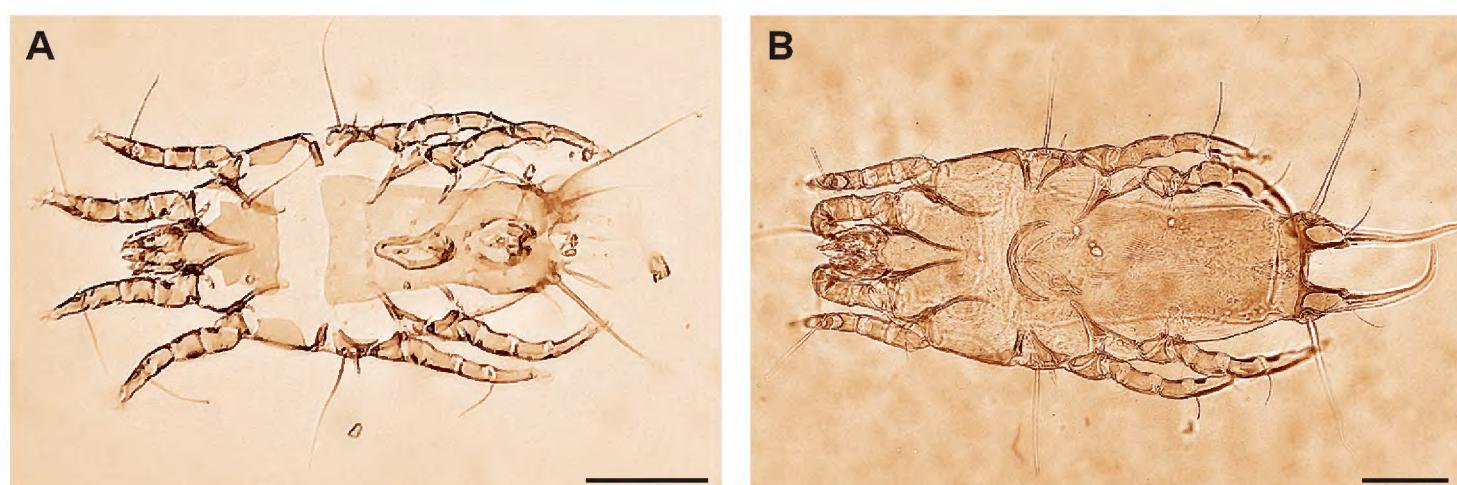


Figure 3. *Proctophyllodes glandarinus* — A Male, B Female (scale bars: 100 µm).

***Proctophyllodes locustellae* Chirov et Mironov, 1987**

Materials examined. 4 males and 4 females from flight and tail feathers ex the River Warbler *Locustella fluviatilis* (Wolf, 1810) (Passeriformes: Locustellidae), Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 12 October 2023, coll. G. Eren.

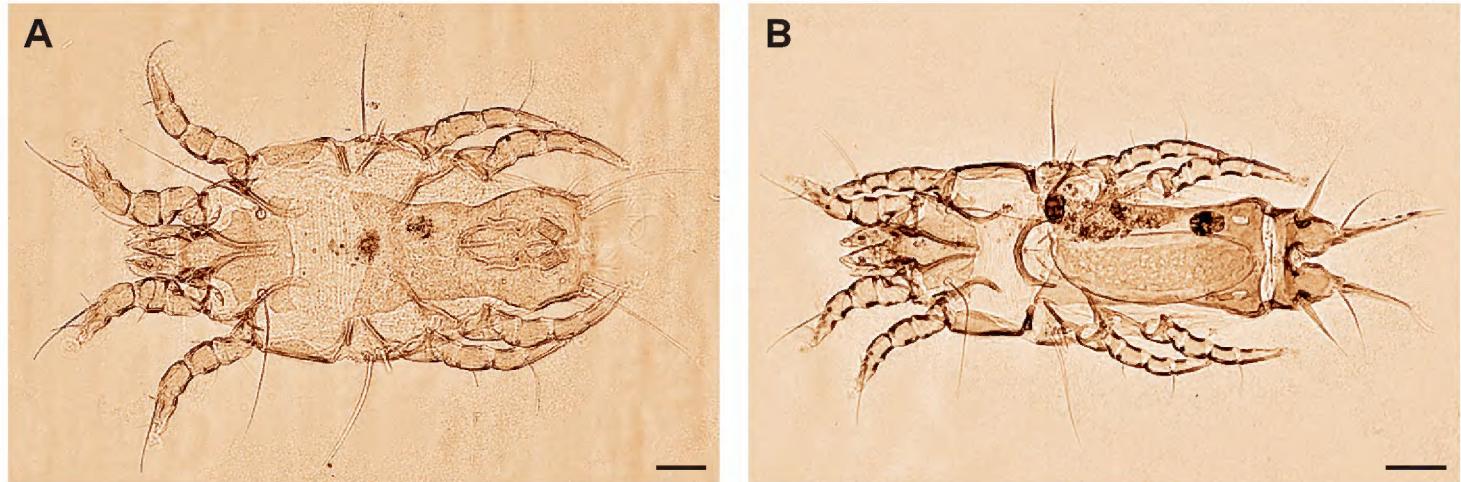


Figure 4. *Proctophyllodes locustellae* — A Male, B Female (scale bars: 100 µm).

***Proctophyllodes microstylifer* Mironov, 2012**

Materials examined. One female from flight and tail feathers ex the Eurasian Wren *Troglodytes troglodytes* (Linnaeus, 1758) (Passeriformes: Troglodytidae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 21 October 2023, coll. G. Eren.

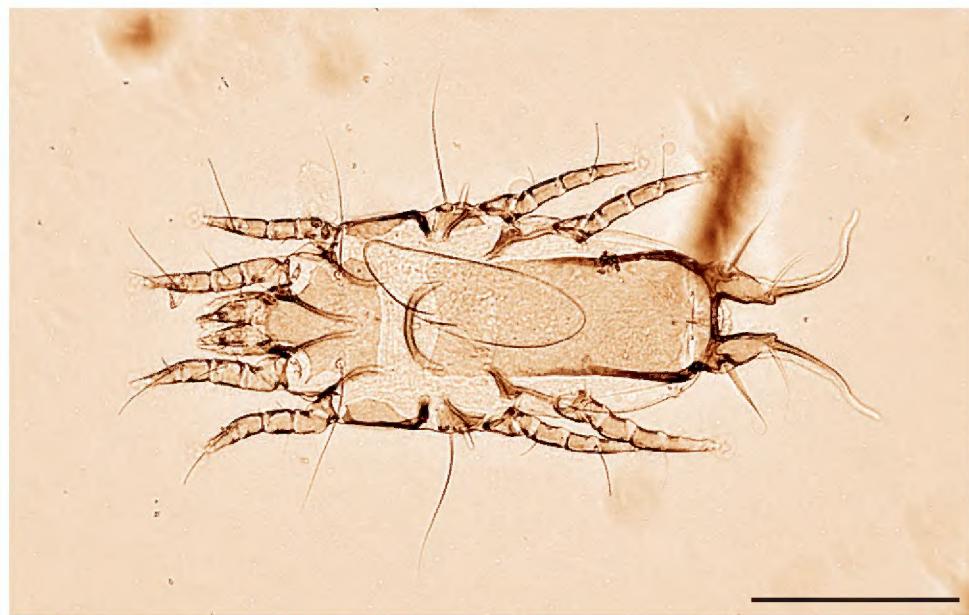


Figure 5. *Proctophyllodes microstylifer* — Female (scale bar: 200 µm).

***Proctophyllodes picae* (Koch, 1840)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Magpie *Pica pica* (Linnaeus, 1758) (Passeriformes: Corvidae), Yakutiye District, Erzurum Province, Türkiye, 23 May 2024, coll. G. Eren.



Figure 6. *Proctophyllodes picae* — Female (scale bar: 200 µm).

***Proctophyllodes pinnatus* (Nitzsch, 1818)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the European Goldfinch *Carduelis carduelis* (Linnaeus, 1758) (Passeriformes: Fringillidae), Merkez District (Çoruh University, Merkez Campus), Artvin Province, Türkiye, 26 March 2023, coll. G. Eren.

***Proctophyllodes scolopacinus* (Koch, 1842)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Woodcock *Scolopax rusticola* Linnaeus, 1758 (Charadriiformes: Scolopacidae), Borçka

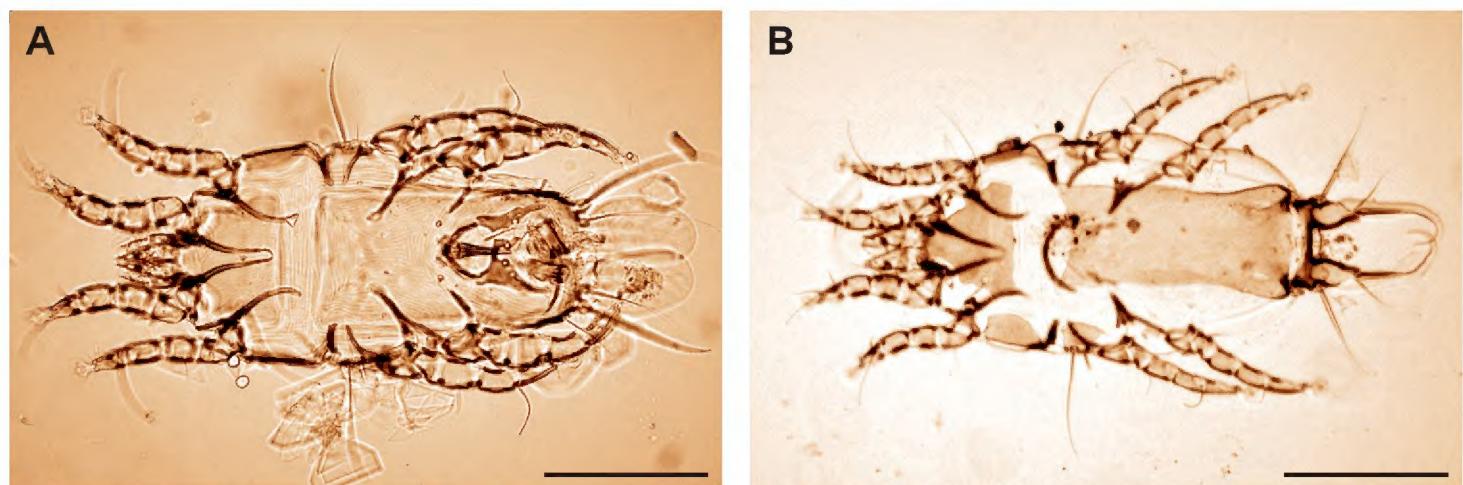


Figure 7. *Proctophyllodes pinnatus* — **A** Male (scale bar: 200 µm), **B** Female (scale bar: 100 µm).

District (Merkez Neighbourhood-Taşlıtarla Location), Artvin Province, Türkiye, 18 March 2023, coll. G. Eren.

***Proctophyllodes sylviae* Gaud, 1957**

Materials examined. 4 males and 6 females from flight and tail feathers ex the Eurasian blackcap *Sylvia atricapilla* (Linnaeus, 1758) (Passeriformes: Sylviidae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 04 July 2023, coll. G. Eren.

Subfamily Pterodectinae Park et Atyeo, 1971

Genus *Montesauria* Oudemans, 1905

The genus *Montesauria* includes over 66 described species associated with members of the order Passeriformes (Alaudidae, Dicruridae, Emberizidae, Estrildidae, Muscicapidae, Ploceidae, Pycnonotidae, Sturnidae, Sylviidae, and Turdidae) (Gaud and Mouchet 1957, Park and Atyeo 1971, Kuroki et al. 2006, Mironov 2006).

***Montesauria merulae* Gaud, 1957**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Jay *Garrulus glandarius* (Linnaeus, 1758) (Aves: Passeriformes: Corvidae), Karasu District (Kuzuluk Neighbourhood-Tuzla Location), Sakarya Province, Türkiye, 1 February 2023, coll. G. Eren.

***Montesauria cylindrica* (Robin, 1877)**

Materials examined. One female from flight and tail feathers ex the Hooded Crow *Corvus cornix* Linnaeus, 1758) (Aves: Passeriformes: Corvidae), Ardeşen District, Rize Province, Türkiye, 19 June 2024, coll. G. Eren.

Feather mite infestation of *Montesauria merulae* (Fig. 8) detected on the Eurasian Jay *G. glandarius* and *M. cylindrica* (Fig. 9) on the Hooded Crow *C. cornix* is a new record for the fauna of feather mites in Türkiye. *Montesauria merulae*

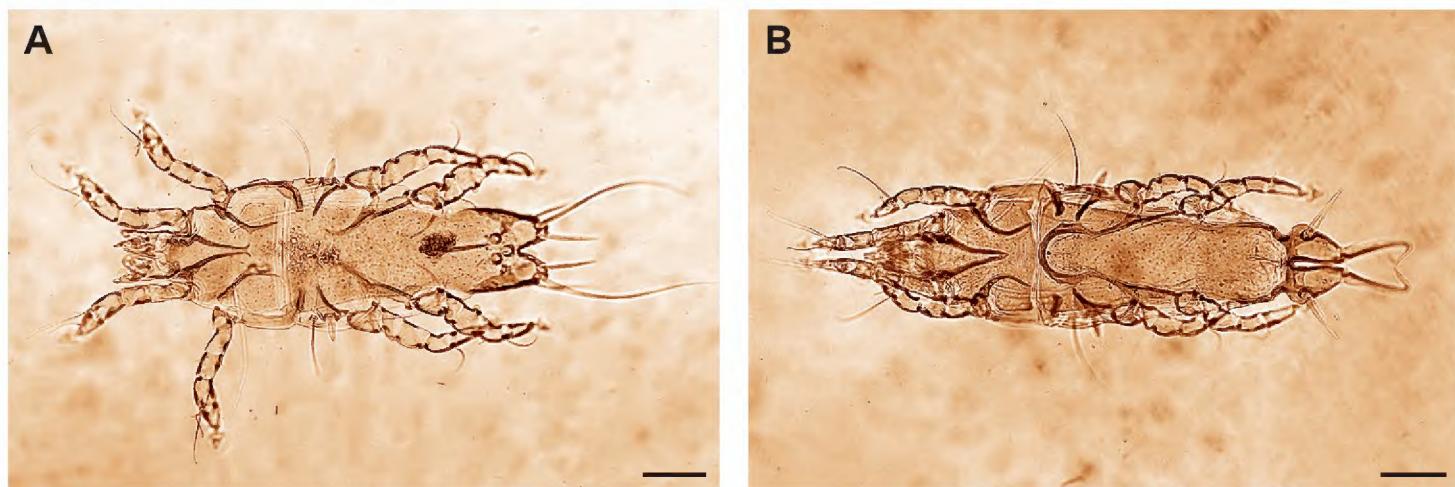


Figure 8. *Montesauria merulae* — A Male, B Female (scale bars: 100 µm).

commonly occurs on the common blackbird *Turdus merula* Linnaeus, 1758 and other thrushes (Gaud and Mouchet 1957; Atyeo and Braasch 1966). The symbiotic interaction between *M. merulae* and *G. glandarius* may have occurred due to natural contamination, because I detected a dense feather mite infrapopulation on both the wing and tail feathers. Comprehensive studies are required to understand whether this case of transfer was accidental or *M. merulae* is widely distributed on the Eurasian Jay in Türkiye.



Figure 9. *Montesauria cylindrica* — Female (scale bar: 100 μm).

Family Psoroptoididae Gaud, 1958

Subfamily Pandalurinae Gaud et Atyeo, 1982

Genus *Pandalura* Hull, 1934

The genus *Pandalura* is currently represented by four described species associated with owls (Strigiformes) and nightjars (Caprimulgiformes) (Philips 2000, Mironov 2011).

***Pandalura cirrata* (Müller, 1860)**

Materials examined. 4 females from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

In this study, *Pandalura cirrata* detected on the Eurasian Eagle-Owl *B. bubo* is a new record for the fauna of feather mites in Türkiye (see in Fig. 10).

Genus *Picalgooides* Cerny, 1974

The feather mite *Picalgooides diaphanoxus* (originally *Mesalges diaphanoxus*) was first described by Bonnet (1924) from seven different hosts, including three species of ravens [*Corvus albus* (=*Corvus scapulatus*), *Corvus fuscicapillus* (=*Macrocorax fuscicapillus*), and *Corvus orru* (=*Corone orru*)], but no subsequent reports have been



Figure 10. *Pandalura cirrata* — Female (scale bar: 100 µm).

made in the years that followed. Although the description of this species, identified as *Mesalges diaphanoxus* in the relevant publication, is brief and the illustrations are incomplete, it is possible to speculate on the genus or family to which this mite belongs. It is also evident that Bonnet's specimens were likely contaminated, as it is improbable for one mite species to occur on such diverse hosts from geographically distant regions. However, the fact that the mites were collected from three species of birds within the same genus provides evidence that these mites are associated with birds of the genus *Corvus*. Therefore, when a type host is not explicitly designated, as is common in such cases, the first-listed host should be fixed as the type host. Accordingly, *Corvus albus* should be considered the type host species (Sergey V. Mironov, personal communication). Compared to other feather mite families, members of the Pandalurinae family have not been adequately researched, and bird-feather mite diversity has not been revealed (Mironov 2004). The genus *Picalgooides* includes 12 currently described species associated with the orders Passeriformes (Corvidae and Furnariidae) and Piciformes (Indicatoridae, Megalaimidae, Picidae, and Ramphastidae) (Bonnet 1924, Mironov et al. 2011, Constantinescu et al. 2014, Mironov and Hernandes 2020, Present study).

The feather mite of *P. diaphanoxus* detected on the common raven *C. corax* is a new record for the fauna of feather mites in Türkiye (see in Fig. 11). It is also a new host-parasite association in the world.

Picalgooides diaphanoxus (Bonnet, 1924)

Materials examined. 4 males and 4 females from flight and tail feathers ex the common raven *Corvus corax* Linnaeus, 1758 (Passeriformes: Corvidae), Borçka District (Küçükköy Village), Artvin Province, Türkiye, 10 April 2023, coll. G. Eren.

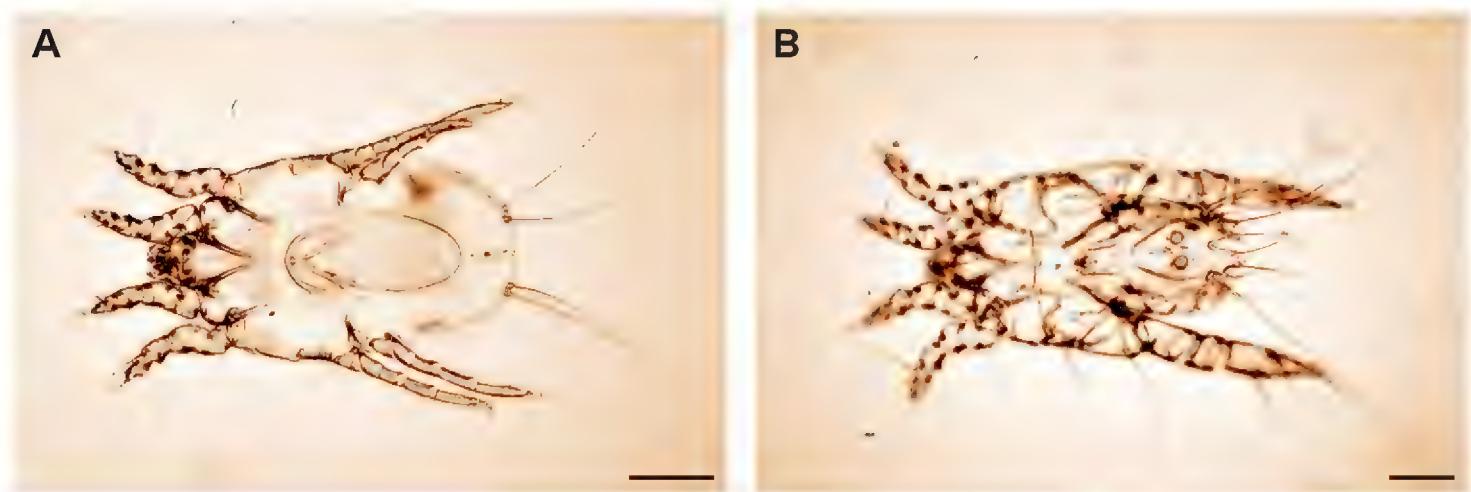


Figure 11. *Picalgoides diaphanoxus* — A Male, B Female (scale bars: 100 µm).

Family Pteronyssidae Oudemans, 1941

Genus *Pteronyssoides* Hull, 1931

The genus *Pteronyssoides* currently includes 32 species associated with birds of the order Passeriformes (Dicruridae, Emberizidae, Estrildidae, Fringillidae, Motacillidae, Nectariniidae, Paradisaeidae, Paridae, Passeridae, Ploceidae, Promeropidae, Pycnonotidae, Timaliidae, Turdidae, and Viduidae) (Faccini and Atyeo 1981, Mironov 1989, Mironov and Wauthy 2005, Mironov et al. 2016, Constantinescu et al. 2018).

In previous studies conducted in Türkiye, *P. striatus* has only been reported on the Eurasian Chaffinch *Fringilla coelebs* Linnaeus, 1758 (Aves: Passeriformes: Fringillidae) (Gürler et al. 2013, Eren et al. 2022).

Pteronyssoides striatus (Robin, 1977)

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Chaffinch *Fringilla coelebs* Linnaeus, 1758 (Aves: Passeriformes: Fringillidae), Borçka District (Zorlu Village), Artvin Province, Türkiye, 9 November 2023, coll. G. Eren.

Genus *Scutulanayssus* Mironov, 1985

The genus *Scutulanayssus* consists of 9 species associated exclusively with swallows (Hirundinidae) (Mironov 1985, 1989, Gaud and Atyeo 1985, Mironov and Galloway 2006). Previous studies in Türkiye have reported only *Scutulanayssus hirundicola* from the barn swallow *Hirundo rustica* (Linnaeus, 1758) (Gürler et al. 2013).

In the present study, *Scutulanayssus ottuki* detected on the western house martin *D. urbicum* are reported for the first time in Türkiye (see in Fig. 12).

Scutulanayssus ottuki (Chirov & Mironov, 1983)

Materials examined. 4 males and 4 females from flight and tail feathers ex the western house martin *Delichon urbicum* (Linnaeus, 1758) (Passeriformes: Hirundinidae),

Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 1 July 2023,
coll. G. Eren.

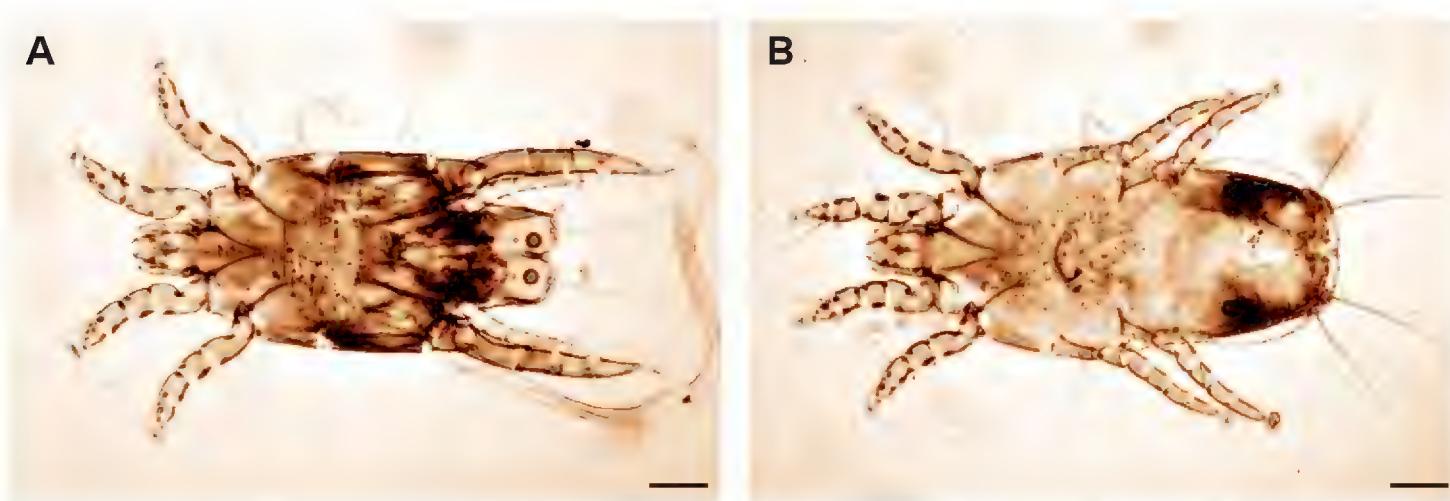


Figure 12. *Scutulanyssus ottuki* — A Male, B Female (scale bars: 100 µm).

Family Trouessartiidae Gaud, 1957
Genus *Trouessartia* Canestrini, 1899

The feather mite genus *Trouessartia* Canestrini, 1899, comprises approximately 150 species, found primarily on birds of the order Passeriformes, with a smaller number occurring on birds of the order Piciformes (Lybiidae and Picidae) (Santana 1976, Gaud 1993, Gaud and Atyeo 1996, Hernandes 2014, Mironov and Bermúdez 2017). Although it has been reported from birds of the orders Charadriiformes, Gruiformes, and Psittaciformes, these records are most likely the result of contamination (Mironov 2022).

Studies conducted so far in Türkiye (Gürler et al. 2013, Per and Aktaş 2018) have reported eight species of this genus: *T. bifurcata* (Trouessart, 1884) from the Eurasian Blackcap *Sylvia atricapilla* (Linnaeus, 1758), the Cetti's Warbler *Cettia cetti* Temminck, 1820, and the Great Reed Warbler *Acrocephalus arundinaceus* (Linnaeus, 1758); *T. inexpectata* Gaud, 1957 from the Common Chiffchaff *Phylloscopus collybita* (Vieillot, 1817), the Eurasian Blackcap *S. atricapilla* (Linnaeus, 1758), and the Sardinian Warbler *Curruca melanocephala* (Gmelin, JF, 1789); *T. jedliczkai* (Zimmermann 1894) from the White Wagtail *Motacilla alba* Linnaeus, 1758; *T. kratochvili* Cerny, 1963 from the Savi's Warbler *Locustella lusciniooides* (Savi, 1824); *T. microcaudata* Mironov, 1983 from the Barn Swallow *Hirundo rustica* Linnaeus, 1758; *T. reguli* Mironov, 1983 from the Goldcrest *Regulus regulus* (Linnaeus, 1758); *T. rubecula* Jablonska, 1968 from the European Robin *Erithacus rubecula* (Linnaeus, 1758); *T. trouessarti* Oudemans, 1904 from the Great Reed Warbler *A. arundinaceus* (Linnaeus, 1758), and the Common Reed Warbler *Acrocephalus scirpaceus* (Hermann, 1804).

The River Warbler *Locustella fluviatilis* (Wolf, 1810) is a new host record for *T. kratochvili* Cerny, 1963 in Türkiye (see in Fig. 13).

***Trouessartia kratochvili* Cerny, 1963**

Materials examined. 4 males and 4 females from flight and tail feathers ex the River Warbler *Locustella fluviatilis* (Wolf, 1810) (Passeriformes: Locustellidae), Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 12 October 2023, coll. G. Eren.

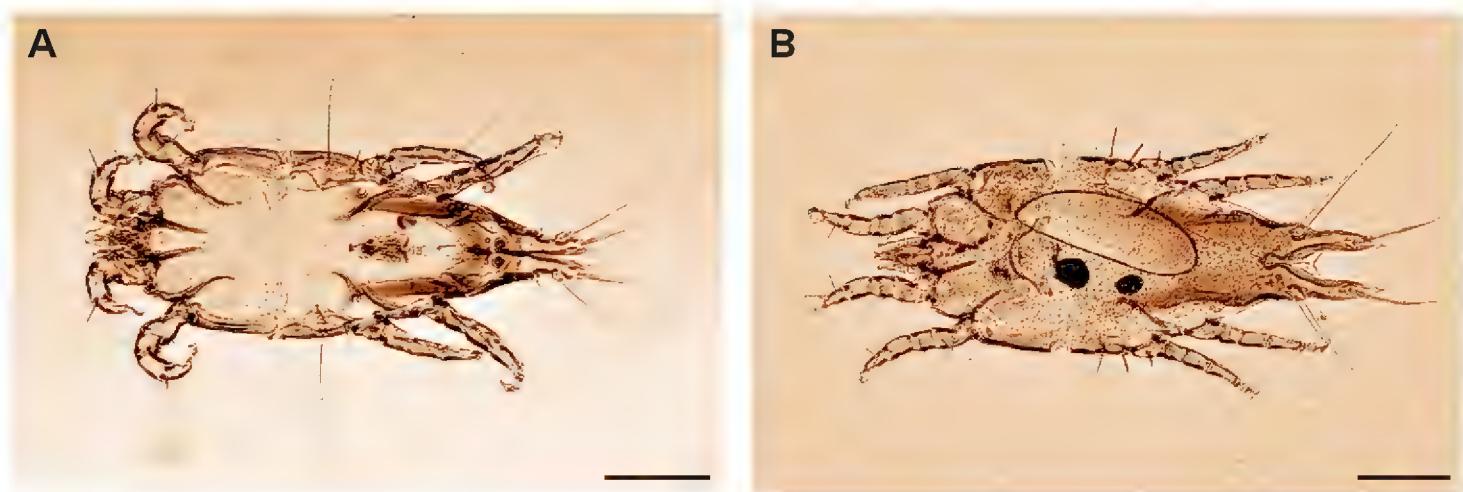


Figure 13. *Trouessartia kratochvili* — A Male, B Female (scale bars: 200 µm).

Family Xolalgidae Dubinin, 1953

Subfamily Ingrassiinae Gaud & Atyeo, 1981

Genus *Glaucalges* Gaud, 1980

The genus *Glaucalges* contains three described species: two species are associated with owls (Strigiformes: Strigidae and Tytonidae) and one species is known from turacos (Musophagiformes: Musophagidae) (Dabert et al. 2008). *Glaucalges attenuatus* (Buchholz, 1869) and *G. tytonis* Dabert et al., 2008 are species that have been reported in different locations and on different owl species (Gaud 1980, Philips 2000). However, the third species *G. pteropus* (Gaud et Mouchet 1959) was detected in only one location and a single host (Gaud and Mouchet 1959).

In the present study, *G. attenuatus* detected on the Eurasian Eagle-Owl *B. bubo* (Linnaeus, 1758) is reported for the first time in Türkiye (see in Fig. 14).

***Glaucalges attenuatus* (Buchholz, 1869)**

Materials examined. 2 males from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Aves: Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

Table 1. Feather mites detected on the avian hosts examined.

Bird species (examined/infested)	Bird orders	Bird families	Feather mite species
<i>Coturnix coturnix</i> (1/1)	Galliformes	Phasianidae	<i>Proctophyllodes hipposideros</i> *
<i>Scolopax rusticola</i> (1/1)	Charadriiformes	Scolopacidae	<i>Proctophyllodes scolopacinus</i>
<i>Asio otus</i> (1/0)			-
<i>Bubo bubo</i> (1/1)	Strigiformes	Strigidae	<i>Pandalura cinnata</i> * <i>Glaucalges attenuatus</i> * <i>Kramerella bubonis</i> *
<i>Buteo buteo</i> (1/0)			-
<i>Buteo rufinus</i> (1/1)	Accipitriformes	Accipitridae	<i>Hieracolichus ramosus</i> **
<i>Falco tinnunculus</i> (1/0)	Falconiformes	Falconidae	-
<i>Nycticorax nycticorax</i> (1/0)	Pelecaniformes	Ardeidae	-
<i>Merops apiaster</i> (1/0)	Coraciiformes	Meropidae	-
<i>Corvus corax</i> (1/1)			<i>Gabucinia delibata</i> ** <i>Picalgooides diaphanoxus</i> *
<i>Corvus cornix</i> (1/1)		Corvidae	<i>Gabucinia delibata</i> ** <i>Montesauria cylindrica</i> *
<i>Garrulus glandarius</i> (1/1)			<i>Montesauria merulae</i> * <i>Proctophyllodes glandarinus</i> *
<i>Pica pica</i> (3/1)			<i>Proctophyllodes picae</i> *
<i>Carduelis carduelis</i> (1/1)			<i>Analges</i> sp. <i>Proctophyllodes pinnatus</i> *
<i>Fringilla coelebs</i> (1/1)		Fringillidae	<i>Monojoubertia microphylla</i> <i>Pteronyssoides striatus</i>
<i>Delichon urbicum</i> (1/1)		Hirundinidae	<i>Scutulanayssus ottuki</i> *
<i>Lanius collurio</i> (1/0)		Laniidae	-
<i>Locustella fluviatilis</i> (1/1)	Passeriformes	Locustellidae	<i>Proctophyllodes locustellae</i> * <i>Trouessartia kratochvili</i>
<i>Erithacus rubecula</i> (1/0)		Muscicapidae	-
<i>Periparus ater</i> (1/1)		Paridae	<i>Proctophyllodes ateri</i> * <i>Strelkoviacarus quadratus</i> <i>Analges</i> sp.
<i>Passer domesticus</i> (1/0)		Passeridae	-
<i>Phylloscopus collybita</i> (1/0)		Phylloscopidae	-
<i>Prunella modularis</i> (1/0)		Prunellidae	-
<i>Sylvia atricapilla</i> (1/1)		Sylviidae	<i>Proctophyllodes sylviae</i> <i>Strelkoviacarus quadratus</i>
<i>Troglodytes troglodytes</i> (1/1)		Troglodytidae	<i>Proctophyllodes microstylifer</i> *
<i>Turdus merula</i> (1/0)		Turdidae	-
<i>Turdus philomelos</i> (2/0)			-

Remarks. *—new record for the Türkiye's fauna, **—new host-parasite association.

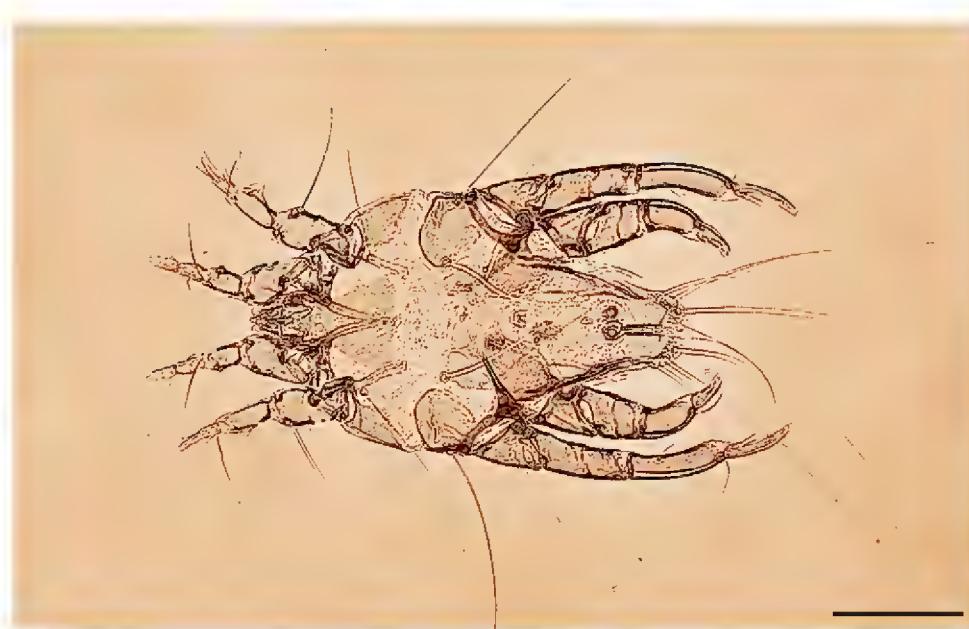


Figure 14. *Glaucalges attenuatus* — Male (scale bar: 100 µm).

Superfamily Pterolichoidea Trouessart and Mégnin, 1884

Family Gabuciniidae Gaud and Atyeo, 1974

Genus *Gabucinia* Oudemans, 1905

The genus *Gabucinia* Oudemans, 1905, consists of three species identified from the members of the family of Corvidae (crows) belonging to the order Passeriformes (Gaud and Atyeo 1974, Hernandes 2020).

In previous studies conducted in Türkiye, *G. delibata* has only been reported on the Hooded Crow, *Corvus cornix* Linnaeus, 1758 (Passeriformes: Corvidae) (Eren et al. 2023). Therefore, the Common Raven *C. corax* Linnaeus, 1758 is a new host record for *G. delibata* (Robin, 1877) in Türkiye.

***Gabucinia delibata* (Robin, 1877)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Common Raven *Corvus corax* Linnaeus, 1758 (Aves: Passeriformes: Corvidae), Borçka District (Küçükköy Village), Artvin Province, Türkiye, 10 April 2023, coll. G. Eren.

Genus *Hieracolichus* Gaud and Atyeo, 1975

The genus *Hieracolichus* includes ten described species related to birds in the order Accipitriformes (seven species from African raptors) (Gaud 1983, Gaud and Atyeo 1974, Hernandes 2017, 2020). In studies conducted to date, *Hieracolichus ramosus* has been reported from the European Honey Buzzard *Pernis apivorus* (Linnaeus, 1758) (Philips 2000).

In previous studies conducted in Türkiye, *H. ramosus* has been reported on Honey Buzzard *Pernis apivorus* (Linnaeus, 1758) (Accipitriformes: Accipitridae) (Eren et al. 2022). Therefore, the Long-Legged Buzzard (*B. rufinus*) (Cretzschmar, 1829) is a new host record for *H. ramosus* in both Türkiye and world (see in Fig. 15).

***Hieracolichus ramosus* (Gaud et Mouchet, 1959)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Long-Legged Buzzard (*Buteo rufinus*) (Cretzschmar, 1829) (Accipitriformes: Accipitridae), Borçka District (Camili Village), Artvin Province, Türkiye, 9 May 2024, coll. G. Eren.

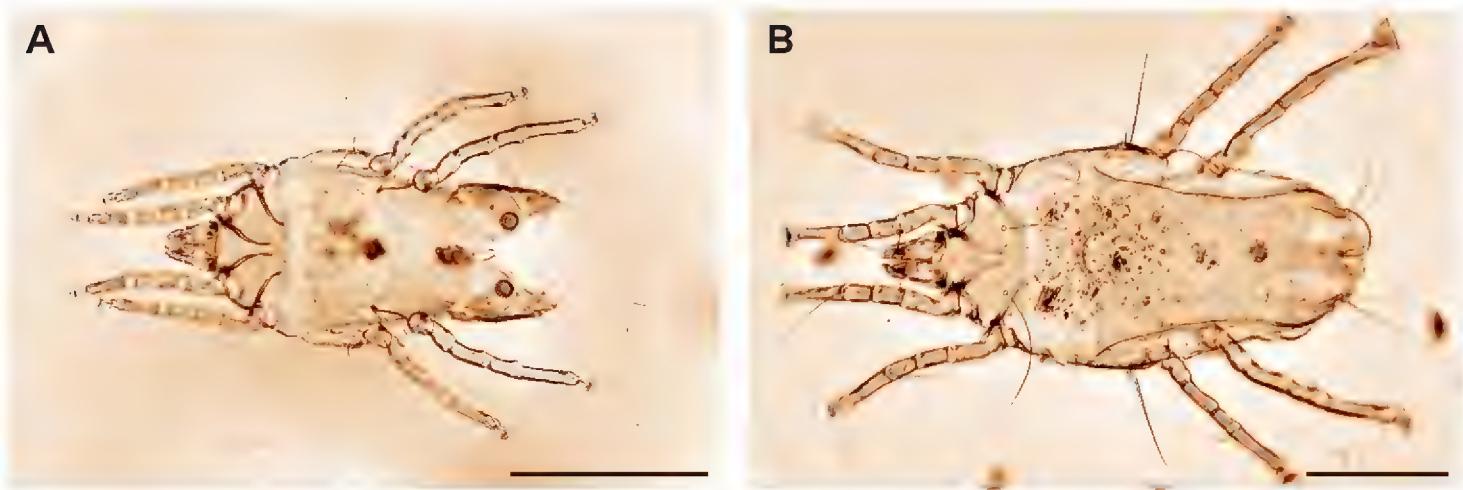


Figure 15. *Hieracolichus ramosus* —A. Male, B. Female (scale bars: 200 µm).

Family Kramerellidae Gaud and Mouchet, 1961

Genus *Kramerella* Trouessart, 1916

The genus *Kramerella* currently consists of ten species associated with owl species of the orders Strigiformes (Dubinin 1953, Gaud 1980, Gaud and Atyeo 1996, Černý and Wiesner 1992); two of these species were detected from some owl species in previous study conducted in Türkiye: *Kramerella aluconis* (Lönnfors, 1937) on the Tawny Owl *Strix aluco* Linnaeus, 1758 (Strigiformes: Strigidae) and *K. lunulata* (Haller, 1878) on the Little Owl *Athene noctua* (Scopoli, 1769) (Strigiformes: Strigidae) (Eren et al. 2023).

In the present study, *K. bubonis* detected on the Eurasian Eagle-Owl *B. bubo* (Linnaeus, 1758) is reported for the first time in Türkiye (see in Fig. 16).

***Kramerella bubonis* (Lönnfors, 1937)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

The data obtained in this study, including new faunistic records and novel host-parasite associations, represent a significant contribution to understanding the diversity, distribution, and host relationships of feather mites in Türkiye. With the addition of 14 species reported herein, the known feather mite fauna of Türkiye now comprises over 70 species across 38 genera and 15 families. To achieve a more comprehensive understanding of this fauna, further systematic studies should be conducted across various geographical regions of the country.

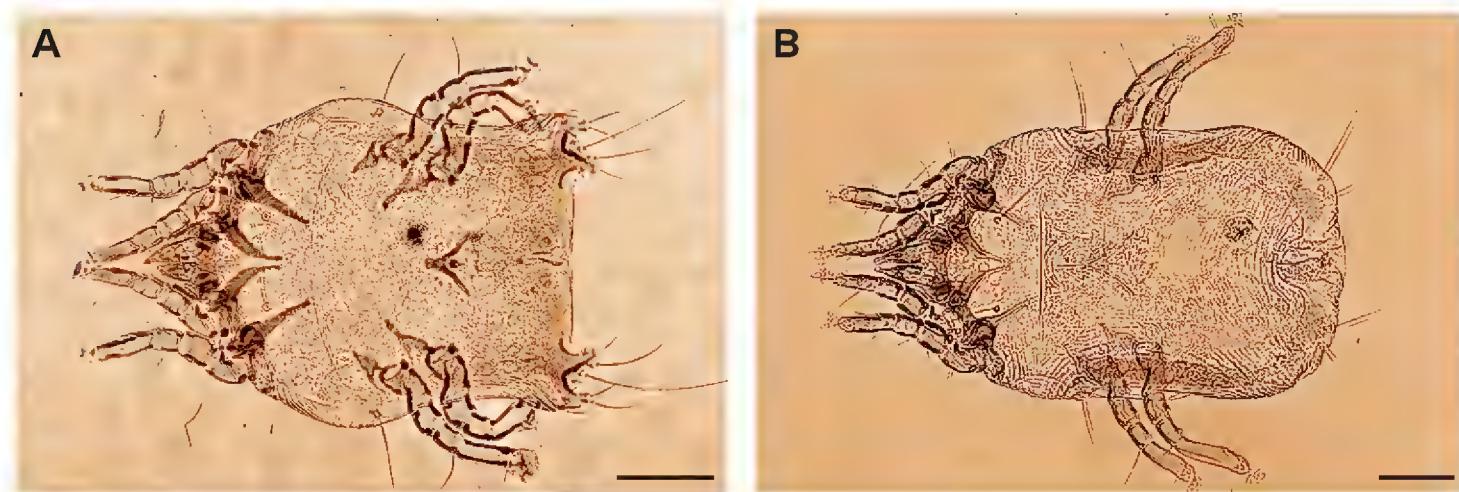


Figure 16. *Kramerella bubonis* — A Male (scale bar: 50 µm), B Female (scale bar: 100 µm).

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References

- Atyeo WT (1967) Four new species of *Monojoubertia* from one species of bird (Analgoidea: Proctophyllodidae). Journal of the Kansas Entomological Society 40: 458–465.
- Atyeo WT (1971) Analgoid mites (Proctophyllodidae) from the Dicaeidae (Aves: Passeriformes). Journal of the Australian Entomological Society 10: 37–42.
- Atyeo WT, Braasch NL (1966) The feather mite genus *Proctophyllodes* (Sarcoptiformes: Proctophyllodidae). Bulletin of the University of Nebraska State Museum, USA, 354 pp.
- Atyeo WT, Gaud J (1970) The feather mite genus *Monojoubertia* Radford, 1950 (Analgoidea: Proctophyllodidae). Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg 4: 145–155.
- Bonnet A (1924) Révision des genres *Megninia*, *Mesalges* et genres voisins de la sous-famille des sarcoptides plumicoles (2e Partie). Bulletin de la Société Zoologique de France 49: 190–218. [In French]
- Černý V (1979) Feather mites (Sarcoptiformes, Analgoidea) of some warblers from Czechoslovakia. Folia Parasitologica 26: 81–84.
- Černý V, Wiesner J (1992) *Kramerella glaucidii* spec. nov. (Acari, Sarcoptiformes, Kramerellidae) – eine neue Milbenart von Sperlingskauz. Anzeiger des Vereins Thüringer Ornithologen 1: 85–87. [In German]
- Chirov PA, Mironov SV (1987) New and Little Known Species of Feather Mites from Passerine Birds of Kirghizia. Izvestiya Akademii Nauk Kirggizskoi SSR 3: 48–51. [In Russian]

- Constantinescu IC, Chișamera G, Mukhim DKB, Adam C (2014) Two new species of feather mites (Acarina: Psoroptidia) from the Great Barbet, *Psilopogon virens* (Piciformes: Megalaimidae). Zootaxa 3893(1): 127–142. doi: 10.11646/zootaxa.3893.1.6
- Constantinescu IC, Adam C, Yao PK, Hilare YB, Chișamera GB, D'Amico G, Gherman CM, Mihalca AD, Sándor AD (2018) Descriptions of two new species of feather mites (Acarina: Psoroptidia: Pteronyssidae) from Ivory Coast. Systematic Parasitology 95: 281–292. doi: 10.1007/s11230-017-9769-6
- Dabert J, Mironov SV (1999) Origin and evolution of feather mites (Astigmata). Experimental and Applied Acarology 23: 437–454. doi: 10.1023/A:1006180705101
- Dabert J, Ehrnsberger R, Dabert M (2008) *Glaucalges tytonis* sp. n. (Analgoidea, Xolalgidae) from the barn owl *Tyto alba* (Strigiformes, Tytonidae): compiling morphology with DNA barcode data for taxon descriptions in mites (Acari). Zootaxa 1719 (1): 41–52. doi: 10.11646/zootaxa.1719.1.2
- Dabert J, Mironov SV, Dabert M (2022) The explosive radiation, intense host-shifts, and long-term failure to diverge in the evolutionary history of the feather mite genus *Analges* (Acariformes: Analgidae) from the European passerines – a molecular approach. *Zoological Journal of the Linnean Society* 195 (2): 673–694. doi: 10.1093/zoolinnean/zlab057
- Dabert J, Mironov SV, Janiga M (2018) Two new species of the feather mite genus *Analges* Nitzsch, 1818 (Analgoidea: Analgidae) from accentors (Passeriformes: Prunellidae) –morphological descriptions with DNA barcode data. Systematic and Applied Acarology 23 (12): 2288–2303. doi: 10.11158/saa.23.12.2
- Dubinin VB (1953) Feather mites (Analgesoidea). Part II. Families Epidermoptidae and Freyanidae. Fauna SSSR. Paukoobraznye. Vol. 6, fasc. 6. Moscow-Leningrad, AN SSSR, 412 pp. [In Russian]
- Eren G, Açıçı M (2022) A contribution to avian ectoparasite fauna of Turkey: the reports of feather mites and tick on the Great tit (*Parus major* L.). Acarological Studies 4 (1): 21–27. doi: 10.47121/acarolstud.970440
- Eren G, Özkoç ÖÜ, Açıçı M (2022) New record of three feather mites (Acariformes: Astigmata) from Turkey. Second International Congress on Biological and Health Sciences Abstract Book, Türkiye, 280. doi: 10.13140/RG.2.2.28088.83207
- Eren G, Öztürk M, Mironov SV, Nisbet HÖ, Açıçı M (2023) New records of feather mites (Sarcoptiformes: Astigmata) from some birds in Türkiye. Acarological Studies 5 (2): 58–68. doi: 10.47121/acarolstud.1244323
- Faccini, JLH, Atyeo WT (1981) Generic revisions of the Pteronyssinae and Hyonyssinae (Analgoidea: Avenzoariidae). Proceedings of the Academy of Natural Sciences of Philadelphia 133: 20–72.
- Gaud J (1957) Acariens plumicoles (Analgesoidea) parasites des oiseaux du Maroc. I. Proctophyllodidae. Bulletin de la Société des Sciences Naturelles et Physiques du Maroc 37: 105–136. [In French]
- Gaud J (1974) Quelques espèces nouvelles de Sarcoptiformes Plumicoles (Analgidae and Dermoglyphidae) parasites d'oiseaux d'Europe. Acarologia 15: 727–758. [In French]

- Gaud J (1980) Acariens sarcoptiformes plumicoles parasites sur les oiseaux Psittaciformes, Strigiformes et Caprimulgiformes en Afrique. Musée Royal de l'Afrique Centrale, Serie 8°, Sciences Zoologiques 230: 1–106. [In French]
- Gaud J (1983) Acariens Sarcoptiformes plumicoles des oiseaux Falconiformes d'Afrique. II. Parasites des Accipitridae et Sagittariidae (Acariens Gabuciniidae). Revue de Zoologie Africaine 97: 737–766. [In French]
- Gaud J (1993) Acariens Sarcoptiformes plumicoles parasites des oiseaux Piciformes d'Afrique. VI. Acariens de la famille Trouessartiidae (Analgoidea). Journal of African Zoology 107 (2): 121–134. [In French]
- Gaud J, Mouchet J (1957) Acariens plumicoles (Analgesoidea) des oiseaux du Cameroun. I. Proctophyllodidae. Annales de Parasitologie Humaine et Comparee 32 (5–6): 491–546. [In French]
- Gaud J, Mouchet J (1959) Acariens plumicoles (Analgesoidea) parasites des oiseaux du Cameroun II. Analgesidae. Annales de Parasitologie Humaine et Comparee 34 (1–2), 149–208. doi: 10.1051/parasite/1959341149 [In French]
- Gaud J, Atyeo WT (1974) Gabuciniidae, famille nouvelle de Sarcoptiformes plumicoles. Acarologia 16: 522–561. [In French]
- Gaud J, Atyeo WT (1985) Les acariens du genre *Pteronyssoides* (Avenzoariidae, Analgoidea) parasites des hirondelles eurafricaines. Acarologia 26: 295–306. [In French]
- Gaud J, Atyeo WT (1996) Feather mites of the World (Acarina, Astigmata): the supraspecific taxa. Annales du Musée Royal de l'Afrique Centrale, Sciences Zoologiques, 277 (Part 1 & 2), 1–193 (text) & 1–436 (illustrations).
- Gürler AT, Mironov SV, Erciyes-Yavuz K (2013) Avian feather mites (Acari: Astigmata) of Samsun, Turkey. Acarologia 53 (1): 17–23. doi: 10.1051/acarologia/20132078
- Hernandes FA (2014) Five new species of the feather mite genus *Trouessartia* Canestrini from South America (Acari: Trouessartiidae). Zootaxa 3856 (1): 50–72. doi: 10.11646/zootaxa.3856.1.2
- Hernandes FA (2017) Rediscovery and redescription of *Hieracolichus hirundo* (Mégnin & Trouessart, 1884) (Astigmata: Gabuciniidae) from the Harpy eagle *Harpia harpyja* (Linnaeus, 1758) (Accipitriformes: Accipitridae). Systematic and Applied Acarology 22: 509–517. doi: 10.11158/saa.22.4.7.
- Hernandes FA (2020) A review of the feather mite family Gabuciniidae Gaud & Atyeo (Acariformes: Astigmata: Pterolichoidea) of Brazil, with descriptions of eleven new species. Zootaxa 4747 (1): 1–53. doi: 10.11646/zootaxa.4747.1.1.
- Hill DS, Wilson N, Corbet GB (1967) Mites associated with British species of *Ornithomya* (Diptera: Hippoboscidae). Journal of Medical Entomology 4 (2): 102–122.
- Karataş A, Erciyas YK, Yavuz N, Ünlü M, Necipoğlu Ö, Kahraman V, Salman M, Özkoç ÖÜ, Bacak E, Kulaçoğlu KC, Kurnuç Z, Gezgin C, Güngör U, Özkan K, Döndüren Ö, Kap B, Yeltekin OÖ (2021) Trakuş Türkiye'nin Kuşları (3rd ed.). Türkiye İş Bankası Kültür Yayınları, Türkiye. 416 pp.
- Kuroki T, Nagahori M, Mironov SV (2006) Two new feather mite species of the genus *Montesauria* (Astigmata: Proctophyllodidae) from thrushes of the genus *Zoothera*

- (Passeriformes: Turdidae) in Japan. Journal of the Acarological Society of Japan 15: 55–68. doi: 10.2300/acari.15.55
- Mack-Fira V, Cristea M (1966) Proctophyllodides de Roumanie et considerations systematiques sur deux especes du genre *Proctophyllodes* Robin 1868. Acarologia 8 (4): 680–695. [In French]
- Mironov SV (1985) Feather mites of the genera *Analges* and *Pteronyssoides* from the European part of the USSR (Sarcoptiformes, Analgoidea). Parazitologicheskii Sbornik 33: 159–208. [In Russian]
- Mironov SV (1989) A review of the feather mites of the subfamily Pteronyssinae from the USSR (Analgoidea, Avenzoariidae). Parazitologicheskij Sbornik, Zoologicheskii Institut AN SSSR, Leningrad, 35: 96–124. [In Russian]
- Mironov SV (2004) Taxonomic notes on four genera of the feather mite subfamily Pandalurinae (Astigmata: Psoroptoididea). Acarina 12 (1): 3–16.
- Mironov SV (2006) Feather mites of the genus *Montesauria* Oudemans (Astigmata: Proctophyllodidae) associated with starlings (Passeriformes: Sturnidae) in the Indo-Malayan region, with notes on the systematics of the genus. Acarina 14 (1): 21–40.
- Mironov SV (2011) Feather mites of the genus *Pandalura* Hull (Astigmata: Psoroptoididae) from owls and caprimulgiforms. Proceedings of the Zoological Institute RAS 315 (1): 19–37. doi: 10.31610/trudyzin/2011.315.1.19
- Mironov SV (2012) New species of the feather mite genus *Proctophyllodes* Robin, 1877 (Acari: Analgoidea: Proctophyllodidae) from European passerines (Aves: Passeriformes), with an updated checklist of the genus. Acarina 20 (2): 130–158.
- Mironov SV (2019a) A new species of the feather mite genus *Analges* Nitzsch, 1818 (Acariformes: Analgidae) from the streaked spiderhunter *Arachnothera magna* (Passeriformes: Nectariniidae), with a renewed diagnosis and world checklist to the genus. Acarina 27: 19–43. doi: 10.21684/0132-8077-2019-27-1-19-43
- Mironov SV (2019b) Two new feather mites of the genus *Proctophyllodes* Robin, 1868 (Acari: Proctophyllodidae) associated with passerines (Aves: Passeriformes) in the Russian Far East. Acarina 27 (2): 151–164. doi: 10.21684/0132-8077-2019-27-2-151-164
- Mironov SV (2022) Notes on the systematics of the feather mite genus *Trouessartia* Canestrini, 1899 (Acariformes: Trouessartiidae) with an updated world checklist. Acarina 30 (2): 157–180. doi: 10.21684/0132-8077-2022-30-2-157-180
- Mironov SV, Wauthy G (2005) A review of the feather mite genus *Pteronyssoides* Hull, 1931 (Astigmata: Pteronyssidae) from African and European passerines (Aves: Passeriformes) with analysis of mite phylogeny and host associations. Bulletin de l’Institut Royal des Sciences Naturelles de Belgique. Entomologie 75: 155–214.
- Mironov SV, Galloway TD (2006) New and little-known species of feather mites (Acari: Analgoidea: Pteronyssidae) from birds in North America. The Canadian Entomologist 138 (2): 165–188.
- Mironov SV, Skirnisson K, Thorarinsdottir ST, Nielsen OK (2010) Feather mites (Astigmata: Psoroptidia) parasitising the rock ptarmigan *Lagopus muta* (Montin) (Aves: Galliformes) in Iceland. Systematic Parasitology 75: 187–206. doi: 10.1007/s11230-009-9219-1

- Mironov SV, Literák I, Sychra O, Čapek M (2011) A new feather mite species of the genus *Picalgoides* Černý, 1974 (Astigmata: Psoroptoididae) from a passerine host in Costa Rica. *Systematic Parasitology* 79: 63–70. doi: 10.1007/s11230-011-9293-z
- Mironov SV, Hernandes FA, Valim MP (2016) A new feather mite of the genus *Pteronyssoides* Hull, 1931 (Astigmata: Pteronyssidae) from thrushes (Passeriformes: Turdidae) in the New World. *Systematic Parasitology* 93: 83–89. doi: 10.1007/s11230-015-9607-7
- Mironov SV, Bermúdez S (2017) Feather mites (Acari: Analgoidea) associated with the Hairy Woodpecker *Leuconotopicus villosus* (Piciformes: Picidae) in Panama. *Acarologia* 57 (4): 941–955. doi: 10.24349/acarologia/20174218
- Mironov SV, Hernandes FA (2020). Taxonomic notes on feather mite species (Acariformes: Analgoidea) described by Adolf Eduard Grube. *Acarina* 28 (2): 213–220. doi: 10.21684/0132-8077-2020-28-2-213-220
- Özkan L, Yukarı BA, Adanır R (2017) Parasites of Spur-Winged Lapwings *Vanellus spinosus* at a colony on the south coast of Turkey. *Wader Study* 124: 75–77. doi: 10.18194/ws.00063
- Park CK, Atyeo WT (1971) A generic revision of the Pterodectinae, a new subfamily of feather mites (Sarcoptiformes: Analgoidea). *Bulletin of the University of Nebraska State Museum* 9: 39–88.
- Pedroso LGA, Hernandes FA (2018) Two new feather mite species of the family Analgidae (Acariformes: Analgoidea) from the Rufous-collared Sparrow *Zonotrichia capensis* (Müller, 1776) (Passeriformes: Passerellidae). *Zootaxa* 4461 (2): 233–244. doi: 10.11646/ZOOTAXA.4461.2.4
- Per E, Aktaş M (2018) The monitoring of feather mites (Acari, Astigmata) of the Warbler (Aves: Sylviidae) species in the Kızılırmak delta, Samsun, Turkey. *Turkish Journal of Zoology* 42 (4): 394–401. doi: 10.3906/zoo-1711-12
- Philips JR (2000) A review and checklist of the parasitic mites. *Journal of Raptor Research* 34 (3): 210–231.
- Philips JR, Fain A (1991) Acarine symbionts of louseflies (Diptera, Hippoboscidae). *Acarologia* 32: 377–384.
- Santana FJ (1967) A review of the genus *Trouessartia* (Analgoidea: Alloptidae). *Journal of Medical Entomology* 13 (1): 1–128.
- Spory GR (1965) Some internal and external parasites of the Redwinged Blackbird, *Agelaius phoeniceus phoeniceus* L., from Central Ohio; including descriptions of three new feather mites. *The Ohio Journal of Science* 65 (2): 49–59.
- Sun LH, He SX, Liu H, Wang ZY (2023) New records of feather mites of the genus *Proctophyllodes* (Acariformes: Proctophyllodidae) in China. *Systematic and Applied Acarology* 28 (1): 53–62. doi: 10.11158/saa.28.1.6
- Trouessart EL, Neumann G (1888) Diagnoses d'espèces nouvelles de Sarcoptides plumicoles (Analgesinae). *Bulletin scientifique de la France et de la Belgique* 19: 325–380. [In French]